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Calculation of Potential Risk from Consumption of Breast Milk

Chemical	Cf (mg/kg)	SFo (mg/kg/day)-1	RfD (mg/kg/day)	h (days)	ADDm (mg/kg/day)	Cmf (mg/kg-lipid)	ADDca-c (mg/kg/day)	ADDnc-c (mg/kg/day)		Mother ELCRm	Child ELCRc	Mother HQm	Child HQc
PCBs	1.6	2	0.00002	2555	0.0034	38	0.00144	0.101		3.0E-03	2.9E-03	172	5030
							Factor above acceptable level		=	2951	2874	172	5030
PCBs TEQ	1.90E-05	1.50E+05	NA	2555	4.1E-08	4.5E-04	1.7E-08	1.2E-06		2.6E-03	2.6E-03		
							Factor above acceptable level		=	2628	2560		
Dioxin TEQ	5.10E-06	1.50E+05	NA	2555	1.1E-08	1.2E-04	4.6E-09	3.2E-07		7.1E-04	6.9E-04		
							Factor above acceptable level		=	705	687		
DDT	0.07	0.34	0.0005	120	0.0002	0.08	3.0E-06	2.1E-04		2.2E-05	1.0E-06	0.30	0.41
							Factor above acceptable level		=	22	1.0	0.30	0.41

Notes:

Site-wide, whole-body 95UCL concentration in small mouth bass (Cf) taken from Round 2 Report, Appendix F, Table 3-14.

Acceptable levels are ELCR = 1E-6 and HQ = 1

ELCRm adjusted to 30-year exposure

Equations

ADDm = (Cf x Irf x Conv x Ff) / BWm

ADDca-c = (Cmf x Irm x f3 x f4 x Edc x Efc) / (Atc x BWc)

ELCRm = ADDm x Sfo

ELCRc = ADDca-c x Sfo

Cmf = (ADDm x h x f1) / (ln2 x f2)

ADDnc-c = (Cmf x Irm x f3 x f4 x Edc x Efc) / (Atnc x BWc)

HQm = ADDm / RfD

HQc = ADDnc-c / RfD

Default Values

Cf	chemical specific	mg/kg	Concentration of chemical in fish
Irf	142	mg/day	Mother's ingestion rate of fish
Conv	0.001	kg/mg	Conversion factor
Ff	1	fraction	Fraction of fish contaminated
BWm	66	kg	Body weight of mother
h	chemical specific	days	Half-life of chemical in body
Fone	0.9	fraction	Fraction of ingested chemical stored in fat
Ftwo	0.3	fraction	Fraction of mother's weight that is fat
Irm	0.69	kg/day	Infant's ingestion rate of milk
Fthree	0.04	fraction	Fraction of breast milk that is fat
Ffour	0.9	fraction	Fraction of ingested chemical that is absorbed
Edc	1	year	Exposure duration of breast-feeding child
Efc	365	days/year	Exposure frequency of breast-feeding child
Atc	25550	days	Averaging time - carcinogens (70 years)
Atnc	365	days	Averaging time - noncarcinogens (Edc x Efc)

Calculated Values

ADDm	mg/kg/day	Average Daily Dose to mother
Cmf	mg/kg-lipid	Chemical concentration in milkfat
ADDca-c	mg/kg/day	Average Daily Dose to breast-feeding child, cancer
ADDnc-c	mg/kg/day	Average Daily Dose to breast-feeding child, non-cancer
ELCRm	risk	Excess Lifetime Cancer Risk to mother
ELCRc	risk	Excess Lifetime Cancer Risk to child
HQm	quotient	Hazard Quotient to mother
HQc	quotient	Hazard Quotient to child

BWc	9.4	kg	Body weight of child
Sfo	chemical specific	(mg/kg/day)-1	Slope Factor - oral
RfD	chemical specific	mg/kg/day	Reference Dose - oral